From GeneConvene Webinar on November 18, 2020.

Questions and Answers not included in recording.

11:27:02 From Stephen Panossian to Panelists : To Dr. Keffler - to alleviate local concerns of adverse test results, improve risk assessment, and assert test accountability, would the approval of a federal "cleanup" fund be helpful?

11:35:14 From Kenneth Oye to Panelists : Can you provide an example where all four of your recommendations have been followed?

11:36:10 From Kenneth Oye to Panelists : with respect to gene drives and prior informed consent of affected parties, would you go with a global or local operational definition of affected parties?

[JR] This has been an issue with solar geoengineering. To me, the default for engagement should be potentially affected. Of course, "affected" could be interpreted to include non-use value, which might imply global engagement. If so, then individual research projects should not bear the burden of such engagement.

11:39:29 From Moeez Khan to Panelists : Great Talk Dr Kofler!
I love the idea of a registry for gene drives and GMOS. Could you talk more about what this registry would look like? Who will be the target audience for it? If it is laymen, how will we ensure that the language is appropriate and simple but at the same time accurate? And how will we advertise the registry amongst stakeholders?

[JR] The WHO registry on human genome editing could offer something of a model. https://www.who.int/news/item/29-08-2019-who-launches-global-registry-on-human-genome-editing

11:40:01 From delphine thizy to Panelists : To Nathalie's presentation: In many of these perspectives on public inputs in regulatory processes (in several recent seminars) North American speakers give the example of the US and the Oxitec case in Florida. But it would be worth looking at other experiences in different locations, such as the public consultation example in Burkina Faso carried out by the national biosafety agency, where they actually went to the villagers living where the genetically modified mosquitoes would be released; or the South Asian experiences with Wolbachia. Is there not a little bit of a bias because some of the internal US issues related to engagement?

11:40:07 From delphine thizy : To Nathalie's presentation: In many of these perspectives on public inputs in regulatory processes (in several recent seminars) North American speakers give the example of the US and the Oxitec case in Florida. But it would be worth looking at other experiences in different locations, such as the public consultation example in Burkina Faso carried out by the national biosafety agency, where they actually went to the villagers living where the genetically modified mosquitoes would be released; or the South Asian experiences with Wolbachia. Is there not a little bit of a bias because some of the internal US issues related to engagement?

11:46:42 From Camilla Beech : To Natalie - you suggest that a registry is required for gene drive organisms. There is already a framework in place for all GMO's via the Clearing house in the Cartagena protocol on biosafety. Can you comment on the use of these existing mechanisms and what a separate registry would cover that this does not ?

11:56:58 From Claudia Emerson : Thank you, Dr. Kofler. I have a question relating to your point that we need to "expand the definition of expert". Isn't the key idea that we need to be respectful and inclusive of affected persons perspectives, and so we must find culturally appropriate ways to discover those perspectives and consider how those views can shape and improve research? That seems to be the point, but that is not the same as 'expanding the definition of experts', which is an epistemological question. That the views of affected communities matters a whole lot and needs to be part and parcel of the process is primarily a normative issue not an epistemic one. I worry that introducing the notion of 'expert' into such matters complicates what is already a problematic issue: the failure to distinguish between fact and value.

12:00:15 From Esther Nakkazi to Panelists : To Natalie; What would you suggest for enough public consultation to be done because what is done in Africa is simply not enough - so what ways (how) would you suggest it is done differently?

{NK} I think it is critical that public consultation is hosted by independent 3rd parties, and are not exclusively led by technology developers, as is the case for Target Malaria. It is also important that public engagement isn't structured using assumptions of the deficit model….in other words, that the public doesn't know enough about the technology and so just informing them will bring them on board. There are strong underlying values and community concerns that need to be unpacked in order to steer good decisions. Another major tension is that these discussions are normally centered on the technology and not the challenge. To empower communities the discussion needs to be focused on the collective challenge they face and then compare across alternatives to address that challenge, weighing risks and benefits across different tools.

12:05:33 From Matthew Grellette : A question for Dr. Kofler: Thank you for your presentation. You suggest that we must be cognizant of how gene drive technologies may play into neo-colonial structures. However, as Dr. Reynolds noted, regional authorities in Africa view this innovation as playing a remedial role, via its ability to combat diseases such as Malaria. Is there some specific point of decolonial concern that you associate with this technology?

{NK} I am concerned about behaviours with echos of imperialism and paternalism as they relate to gene drive technologies in Africa. I have been pleased to see the empowered and informed stance of African Union governments and their understandable desire to explore gene drive tech as a public health tool. That being said, these are technologies being designed and engineered exclusively by European and American research groups and then exported and trialed in

countries like Burkina Faso. Consideration needs to be given to bolstering and supporting the African scientific community so that technologies can be designed for and by the communities that want them. Secondly, consideration needs to be given to where trial sites are determined, and to ensure that the areas of trial have robust risk assessment and empowered community members to make sure good decisions are made. I have a feeling that Target Malaria wouldn't be able to trial their gene drive mosquito in the U.K. for example.

12:05:51 From Jason Delborne to Panelists : Comment for Dr. Reynolds: While I agree that "global gene drives" are generally matters of public benefit, research on self-limiting GDOs (e.g., threshold drives) create significant opportunities for application to pest management, including in agriculture. It seems important that we do not ignore the role of agricultural priorities in driving the priorities for GDO R&D as we move forward. This also aligns with the history of GMOs, where public-good innovations were envisioned (e.g., ending world hunger), but most R&D focused on technologies that aligned with commercial interests (e.g., herbicide-tolerant crops).

12:12:14 From Kenneth Oye to Panelists : Natalie - thanks!

12:12:19 From Jason Delborne : Comment for Dr. Reynolds: While I agree that "global gene drives" are generally matters of public benefit, research on self-limiting GDOs (e.g., threshold drives) create significant opportunities for application to pest management, including in agriculture. It seems important that we do not ignore the role of agricultural priorities in driving the priorities for GDO R&D as we move forward. This also aligns with the history of GMOs, where public-good innovations were envisioned (e.g., ending world hunger), but most R&D focused on technologies that aligned with commercial interests (e.g., herbicide-tolerant crops).

[JR]. I agree. GDOs currently present little opportunity for private use and commercialization, but this may change. Observers and regulators should remain vigilant.

12:12:28 From delphine thizy : If I may, thanks for acknowledging the bias and focus on the US. The issue is many of those papers and recommendations get escalated to global recommendation when as you rightly state, this is not designed to be the case. I am wondering what kind of support is provided to other academics in Africa or other affected locations to think through those topics?

12:12:30 From Mamadou Coulibaly to Panelists : To Jesse: "Gene drive has incentives that are different". Hoping I got this correctly, could you please explain it in simple English? Thanks.

[JR] The direct benefits of a “traditional” agricultural genetically modified organism (GMO) are largely limited to the farmer who uses them. (Some benefits may be passed on to consumers.) A farmer might wish to buy such GMOs and a producer of them could sell them. For this reason, private firms have the incentive to research, develop, sell, and market agricultural GMOs. In economic terms, the benefits are “excludable” and the GMO is a “private good,” much like a tractor. Nevertheless, agricultural GMOs and other private goods can have some effects on third parties, so some regulation may be warranted.

In contrast, the direct benefits of a gene drive organism (GDO) -- such as disease vector and invasive species eradication -- are poorly contained and widely dispersed. A private person or business has little reason to buy them, and producers have little incentive to research, develop, sell, and market GDOs. In economic terms, the benefits are “nonexcludable” and the GDO is a “public good,” like roads and national defense. However, governments usually provide public goods and might wish to develop them or perhaps buy them from a business.

As Prof. Delbourne pointed out (below), private and public goods are ideal types. In reality, goods are on a spectrum from private to public.

12:15:19 From Kenneth Oye to Panelists : Re Jason's question - not just self limiting for agriculture. How evaluate / test self-limiting mechanisms? How define affected parties with respect to work on localization? With respect to demonstrable effective localization mechanisms if credibly demonstrated?

12:16:28 From Stephanie James to Panelists : For Dr. Kofler: You use the term "global oversight". In the case of a gene drive application that is expected to be geographically limited, as for example mosquitoes limited to Africa, how would you balance the influence of opinions from the public living in potentially affected areas versus the public in other areas of the globe?

12:18:24 From Kenneth Oye to Panelists : Natalie - yes -- that is the point!

12:27:20 From Natalie Kofler to Hector Quemada (Privately) : I would love to answer claudia question

12:31:03 From Esther Nakkazi to Panelists : Well said Natalie